FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	M08210	Client:	Alaskan Copper Works
Date Received:	01/12/12	Project:	% of Acid PO M08210, F&BI 201134
Date Extracted:	01/17/12	Lab ID:	201134-01 x1000
Date Analyzed:	01/17/12	Data File:	201134-01 x1000.056
Matrix:	Aqueous	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Indium	96	60	125
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	455,000
Nickel	293,000
Copper	28,100
Zinc	<1,000
Arsenic	<1,000
Silver	<1,000
Cadmium	<1,000
Lead	<1,000
Iron Screen	2,190,000

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Alaskan Copper Works
Date Received:	Not Applicable	Project:	% of Acid PO M08210, F&BI 201134
Date Extracted:	01/17/12	Lab ID:	I2-45 mb
Date Analyzed:	01/17/12	Data File:	I2-45 mb.036
Matrix:	Aqueous	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125
Indium	97	60	125
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Silver	<1
Cadmium	<1
Lead	<1
Iron Screen	<250

Date of Report: 01/23/12
Date Received: 01/12/12
Project: % of Acid PO M08210, F&BI 201134
Date Extracted: 1/16/12
Date Analyzed: 1/16/12

RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR SPECIFIC GRAVITY @ 15.56 °C

Sample ID Laboratory ID	Specific Gravity
M08210 1201134-01	1.08

Note: The third significant digit is an estimate

Date of Report: 01/23/12
Date Received: 01/12/12
Project: % of Acid PO M08210, F&BI 201134
Date Analyzed: 01/17/12

RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR PERCENT ACID

Sample ID Laboratory ID	Percent Acid
M08210 201134-01	5.8

Date of Report: 01/23/12
Date Received: 01/12/12
Project: % of Acid P O M08210, F&BI 201134

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AQUEOUS SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 201176-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	ug/L (ppb)	20	<1	103	100	67-132	3
Nickel	ug/L (ppb)	20	<1	100	98	73-119	2
Copper	ug/L (ppb)	20	<1	99	96	50-144	3
Zinc	ug/L (ppb)	50	1.43	97	96	46-148	1
Arsenic	ug/L (ppb)	10	1.47	103	97	56-167	6
Silver	ug/L (ppb)	5	<1	99	96	66-121	3
Cadmium	ug/L (ppb)	5	<1	100	95	86-118	5
Lead	ug/L (ppb)	10	<1	102	98	76-125	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	97	66-135
Nickel	ug/L (ppb)	20	100	67-134
Copper	ug/L (ppb)	20	99	66-134
Zinc	ug/L (ppb)	50	98	57-135
Arsenic	ug/L (ppb)	10	99	55-128
Silver	ug/L (ppb)	5	99	64-136
Cadmium	ug/L (ppb)	5	99	66-135
Lead	ug/L (ppb)	10	101	67-135

Date of Report: 01/23/12
Date Received: 01/12/12
Project: % of Acid PO M08210, F&BI 201134

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AQUEOUS SAMPLES FOR SPECIFIC GRAVITY @ 15.56 °C

Laboratory Code: (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Specific Gravity	1.08	1.08	0	0-2

Date of Report: 01/23/12
Date Received: 01/12/12
Project: % of Acid PO M08210, F&BI 201134

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR PERCENT ACID

Laboratory Code 201134-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Percent Acid	5.8	5.7	2	0-20

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

201134

SAMPLE CHAIN OF CUSTODY ME 01-12-12 AI3

Send Report To Gerald Thompson
Company Alaskan Copper Works
Address 628 S. Hanford St
City, State, ZIP Seattle WA 98134
Phone # 206-571-6035 Fax # 206-382-4309

SAMPLERS (signature)
PROJECT NAME/NO. % of Acid
PO # M0810
REMARKS

Page # ___ of ___
TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH 1 day
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	% of Acid	Spec. Gravity	Ag-As-Cd	Cr-Cu-Fe	Ni-Pb-Zn	Notes
M0810	01	1/12/12	10:30	HW03	1							X	X	X	X	X	

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Gerald Thompson	ACW	1/12/12	11:22
Received by:		DAVID	F&BI	"	"
Relinquished by:					
Received by:					

Samples received at 2°C

Friedman & Bruya, Inc.
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Seattle, WA 98119-2029
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FRIEDMAN & BRUYA, INC.

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January 23, 2012

Gerald Thompson, Project Manager
Alaskan Copper Works
628 South Hanford
Seattle, WA 98134

Dear Mr. Thompson:

Included are the results from the testing of material submitted on January 12, 2012 from the % of Acid PO M08210, F&BI 201134 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
ACU0123R.DOC